CEO reputation, quality management and environmental innovation: the roles of stakeholder pressure and resource commitment

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Abstract
In this paper, we examine how and when chief executive offers' (CEOs') reputation enhances environmental innovation by considering quality management as a mediating mechanism of this relationship. In addition, we introduce stakeholder pressures (primary and secondary stakeholder pressures) as important contingencies of the relationship between CEOs' reputation and quality management. Moreover, we test the moderating role of resource commitment on the quality management-environmental innovation relationship. We test our research model using data from a manufacturing industry sample of 217 firms from Ghana. We find that quality management mediates the relationship between reputation and environmental innovation. Moreover, the relationship between CEOs' reputation and quality management is amplified when levels of both primary and secondary stakeholder pressures are greater. Finally, our findings show that the effect of quality management on environmental innovation is enhanced when resource commitment is greater. Implications for theory and practice are discussed.

Keywords: *CEO; reputation; Ghana; quality management; stakeholder engagement; environmental innovation; stakeholder pressures; resource commitment*

1. Introduction

Since the turn of this century, reputations of firms, individuals and nations have increasingly come to be viewed as one of the key assets that can be harnessed to counteract threats to gain legitimacy (see Amankwah-Amoah and Debrah, 2017; Newburry, 2012). Accordingly, greater emphasis has been placed on individuals in relation to the degree to which their reputation can spur business performance (Downing and Ma, 2017). Reputation is conceptualised as the information related to an individual's past performance (Podolny, 1994; Shane and Cable, 2002). Most often, support from trusted third parties has been used as a mechanism to certify support for the existence of the reputation (Sanchez-Marin and Baixauli-Soler, 2014). For example, winning a prize for recognition within an industry often enhances the chief executive officer's (CEO's) reputation and at the same time increases the firm's credibility in the eyes of its principal stakeholders (Fombrun, 1996; Hayibor et al., 2011; Heugens, Van Riel and Van Den Bosch, 2004; Fombrun and van Riel, 1997). Arguably, CEOs invest in individual reputation building-related activities to reduce uncertainty associated with products or services (Downing and Ma, 2017). Given the constant flux of the business environment, reputation tends to provide a stable rent for stakeholders. For entrepreneurial teams in resource-constrained environments, the ability to craft a good reputation can be an important resource

for the firm's growth and performance. An emerging stream of enquiry links firm resources with the ability to deploy them effectively; suggesting that what a firm does with its resources is at least as important as which resources it possesses (Hansen, Perry and Reese, 2004). The resource-based theory suggests that such firms' resources create competitive advantage (Barney, 1991; Sirmon et al., 2011; Wernerfelt, 1984). For example, the entrepreneurial team's reputation can be used to leverage the firm's resources with the purpose of creating value for customers and competitive advantages for the firm (Sirmon et al., 2011). Thus, entrepreneurial reputation in emerging economies can be considered a scarce resource that cannot be imitated by firms (e.g. Christmann, 2000; Hart, 1995; Russo and Fouts, 1997). In general, research indicates that the CEOs reputation has a positive effect on firm outcomes (Xie and Lv, 2018). Therefore, reputation can be considered an influencer of activities related to environmental innovation.

In spite of the importance placed on reputation by researchers and practitioners, our understanding about how reputation drives environmental innovation has not been examined explicitly. While the mechanism often used to explain a positive association between reputation and firm outcomes is intuitively appealing (Petkova, 2014; Xie and Lv, 2018), an understanding related to how and when entrepreneurial reputation drives environmental innovation lacks theoretical clarity. The urgency to address this deficit in the innovation literature motivates this study. Thus, our study seeks to examine at the individual level: (1) how reputation influences environmental innovation and the mediating mechanism (i.e., quality management) of this relationship, and (2) the factors that may moderate the relationship between reputation and quality management.

This study contributes to the literature in several aspects. First, previous research (Podolny, 1994; Sanchez-Marin and Baixauli-Soler, 2014; Shane and Cable, 2002; Xie and Lv, 2018) has not examined the underlying mechanisms through which reputation influences environmental innovation. In a departure from previous studies, we seek to obtain evidence

crucial to this question by investigating the potential mediating role of quality management, which has often been found to be strongly related to firm outcomes such as innovation. Understanding the mechanism through which reputation affects environmental innovation is crucial because it will provide researchers with a clearer understanding of how these variables work in concert with one another.

Second, we identify stakeholder mechanisms that may explain when micro-level variables such as entrepreneurial reputation are related to quality management. In doing so, we extend previous studies that examine factors driving quality management in firms (Agarwal, et al., 2013; Debackere, et al., 1997; De Weerd-Nederhof, et al., 1997; Roth and Jackson III, 1995). That is, we argue that the value derived from deploying superior entrepreneurial reputation in driving quality management is strengthened when stakeholder pressures are greater. Following our first and second contributions, there is a fundamental question: if some firms' level of quality management drives environmental innovation, under what condition will this happen? This is an important question to ask because quality management and environmental innovation are business practices that determine firm success (Baird et al., 2011; Pereira-Moliner, et al., 2012). Our third contribution is to identify one such condition. When the resource commitment is stronger, the level of quality management towards environmental innovation becomes stronger.

Finally, our present study extends the scope of prior research by examining the potential role of entrepreneurial reputation on environmental innovation in an environment not studied in previous studies (Ghana). Small firms in resource-poor economies have not been the focus of environmental strategy research due to their presumed lack of interest and resources to go beyond regulatory compliance (Aragón-Correa, et al., 2008; Russo and Fouts, 1997). In highly resource-constrained and uncertain circumstances, firms need to make the best use of the capabilities and resources at their disposal (Al-Atwi et al., 2019; Thornhill, 2006), which is especially the case in sub-Saharan Africa (Acquaah, 2007; Obeng and Blundel, 2015). As an

emerging economy, Ghana is experiencing significant turbulence and small firms often encounter constraints and uncertainties. Therefore, it is vitally important for top executives to build their reputation to establish legitimacy to effectively access the resources required for their firm's success.

The paper is structured in the following manner. The next section presents a review of the literature on reputation, quality management and environmental innovation. After developing our hypotheses, we present the research context, method and approaches adopted. We then present the empirical findings and outline the implications of the findings and analysis.

2. Theoretical Background and Hypotheses

2.1 Resource-based view

We derive insights from the resource-based view (RBV) (Barney, 1991; Wernerfelt, 1984) to argue that reputation is a major intangible resource endowment of a firm which is crucial for firms to reap entrepreneurial behaviours (Covin and Slevin, 1991). As advanced by prior research, the resources and capabilities inherent in the firm represent a crucial factor for the firm to innovate (Covin and Slevin, 1991). A major explanation of the RBV lies in the view that certain conditions help explain which resources internal to the firm enable it to achieve sustained competitive advantage (Barney, 1991; Barreto, 2010). In strategic management, resources refer to "stocks of available factors that are owned or controlled by the firm" whilst capabilities reflect "a firm's capacity to deploy resources, usually in combination, using organisational processes, to effect a desired end" (Amit and Schoemaker, 1993, p. 35). A major tenet of the RBV is that firms are likely to achieve sustained competitive advantage when they acquire and control valuable, rare, inimitable and non-substitutable resources (Teece, Pisano and Shuen 1997). The strategic management literature indicates that a firm's strategic resources manifest themselves based on how the firm utilises them (Helfat and Winter 2011). Given this situation, researchers have been advised to select relevant firm-level processes in which a

firm's strategic resources (e.g., environmental innovation) reside to explore research hypotheses. A firm's level of environmental innovation is thus considered to be a strategic resource that may offer the firm the ability to compete in the market. Therefore, in the light of the present research, we define environmental innovation as the degree to which a firm embeds environmental concerns in developing products and services for its target market.

2.2 Stakeholder theory

Stakeholder theory has been used as a theoretical lens to illuminate how firms manage their relationships with external actors (Freeman, 1984; Goodman et al., 2017). The theory suggests that a firm consists of an open, flexible system or a combination of actors. Stakeholders are considered as persons, organisations or groups that can influence or are affected by the activities of the firm (Freeman, 1984; Danso et al., 2019a). Accordingly, firms must maintain "simultaneous attention to the legitimate interests of all appropriate stakeholders" (Donaldson and Preston, 1995, p. 67). In addition, the stakeholder theory suggests that different stakeholders can exert pressure on firms to alter their behaviour by adopting new work practices and routines (Durugbo and Amankwah-Amoah, 2019; Eesley and Lenox, 2006; Freeman, 2005). It has been established that, by responding to stakeholder demands in product or service development, firms can achieve improved innovation outcomes (e.g., Vargo and Lusch, 2004) and firm performance (Ommen et al., 2016; Phillips et al., 2017). For example, pressures from stakeholders can contribute to organisational efforts by offering new ideas and suggestions which ultimately help the organisation improve product design and processes and eliminate inefficient practices (Ommen et al., 2016). Thus, CEOs who pay attention to stakeholder demands are likely to build a stronger reputation for innovation. This view is supported by prior studies that suggest that, when stakeholders' demands are met and integrated into the management practices, it can be a source of capability that may help the firm obtain a competitive advantage. We suggest that, although reputation may be ideal for quality management and innovation, it may not be a strong enough condition for environmental

innovation. Therefore, meeting stakeholder pressures may help convert reputation into heightened quality management practices and subsequent environmental innovation. Thus, by stakeholder pressures, we refer to pressures from primary stakeholders (e.g., government, customers/suppliers, employees and competitors) and pressures from secondary stakeholders (e.g., local community, non-governmental organisations and media) (Danso et al., 2019a, 2019b). As such, we utilise stakeholder theory due to its potency in providing the requisite exposition of stakeholder behaviour such as pressure and other attributes. Via stakeholder theory lens, we intend to explore whether pressures from primary and secondary stakeholder groups exert the same magnitude of influence.

2.3 Reputation and quality management

Studies examining reputation have not focused on the entrepreneurial teams or the individual entrepreneur but rather on the firm's reputation in accessing investments or venture capital. For example, reputation literature has identified several reputation outcomes including the ability of the firm to charge premium prices (e.g., Rindova et al., 2005; Standifird, 2001), survive (e.g., Rao, 1994), develop competitive advantage and increase customer retention (Rindova et al., 2005; de Castro, Lopez and Saez, 2006). According to Lähdesmäki and Siltaoja (2010), reputation is a valuable economic resource of businesses which enables them to attract customers and improve profitability. For example, the resource-based view (RBV) recognises reputation as a valuable intangible resource (Grant, 1991; Hall, 1992). Thus, reputation can be considered a crucial resource for building sustained competitive advantage for the firm.

Given this and many other benefits derived from reputation, any issue that tends to tarnish the personal reputation of the CEO is likely to affect the firm's image and subsequent performance. With increased market competition, the successful management of quality is crucial for survival and success (Bourke and Roper, 2017). The CEO's reputation can therefore be linked to quality improvement and innovation as the firm seeks to create and defend its competitive position (Pekovic and Galia, 2009). This assertion may be true given that most

CEOs tend to interact directly and closely with clients to convince them of the quality and specialised skillset their businesses provide (Shaw et al., 2008). This is more pronounced in developing economies, where owners tend to utilise their personal reputation to promote the firm's products and services (Rindova et al., 2005). Thus, the reputation serves as a critical resource that may spur customer patronage as most customers tend to perceive that CEOs with a higher reputation are likely to deliver quality goods and services. Thus, with greater reputation in an industry or society, CEOs are more likely to show continuous attention to quality management in the entire operational process to uphold their personal reputation. We therefore hypothesise that:

H_{1a}: *The reputation of the CEO positively relates to quality management*

2.4 The moderating role of stakeholder pressures

The role of stakeholders in a firm's behaviour has been argued as being relatively predictable (Holzer, 2008). However, research examining the contingent effect of stakeholder pressures on the reputation-quality management linkage is lacking. Primary stakeholders such as employees, customers and government are crucial for the survival of the firm whilst secondary stakeholders such as media and non-profit-making firms tend to influence public opinion and therefore can tarnish or boost reputation (Godfrey, Merrill and Hansen, 2009; Harrison et al., 2010). Primary stakeholders usually affect the firm's activities due to their direct relationship with the firm's operations (Castka and Prajogo, 2013; Freeman, 1984). Accordingly, primary stakeholders exert pressures on the firm to achieve their expectations of products and services. These pressures tend to be mimetic and normative (DiMaggio and Powell, 1983), which creates a corresponding response from the firm to alter its activities.

By putting pressure on the firm to create value, CEOs with a stronger reputation cannot afford to ignore the pressure that stakeholders place on the firm to create value. Creating stakeholder value for primary stakeholders is crucially vital to improve the firm's well-being

(Harrison et al., 2010). As such, primary stakeholders such as suppliers, employees and customers tend to communicate their concerns through negative publicity and word of mouth (Castka and Prajogo, 2013) by attaching the CEOs reputation to the overall service delivery. Such pressure from primary stakeholders can help CEOs to practise quality management to sustain their reputation in the market. Therefore, meeting the requirements of primary stakeholders boosts the CEO's quality management efforts.

On the other hand, secondary stakeholders (e.g. NGOs and media) could have a moderating influence on the reputation-quality management relationship. The institutional theory (Campbell, 2007) specifies that activities of stakeholder groups such as non-governmental organisations (NGOs) and the media can impact reputation and encourage them to embark on quality management efforts. This assertion is based on the notion that secondary stakeholders often put indirect pressures on CEOs to provide quality goods and services in the market. These pressures are exerted through information targeted at setting social agendas to influence entrepreneurial activities through the mass media (Campbell, 2007). For example, reputation is considered to be an important resource in improving secondary stakeholders' perception about quality of products and services. Accordingly, when secondary stakeholders exert pressure, CEOs cannot compromise on quality management as doing so may adversely affect their reputation (Abratt and Kleyn, 2012). Thus, secondary stakeholders serve as 'watchdogs' to influence entrepreneurial behaviours (Zietsma and Winn, 2008; Gardberg and Newburry, 2013). Overall, we suggest that:

> ***H_{1b}:*** *Primary stakeholder pressures positively moderate the relationship between CEOs reputation and quality management*
>
> ***H_{1c}:*** *Secondary stakeholder pressures positively moderate the relationship between CEOs' reputation and quality management*

2.5 Reputation, quality management and environmental innovation

Firms typically respond to environmental challenges by pursuing quality management strategies (Bourke and Roper, 2017). It has been suggested that, when a firm commits to quality

management practices, it is likely to improve firm-level outcomes such as profitability and competitiveness (Morgan and Vorhies, 2001). It has also been established that the way firms integrate environmental issues into their strategies while enhancing their competitive advantage is through environmental innovations. Yet, earlier research indicates that CEOs' reputation tends to serve as a major intangible resource that is likely to boost firm-level outcomes (Downing and Ma, 2017. However, how these variables work in concert with one another lacks theoretical precision. Environmental innovation reflects activities that focus on creating value in goods and processes whiles considering the good of the environment (Li, 2014; Zhu and Sarkis, 2004). This suggests that environmental innovation differs from other innovations given that their externalities, drivers and introduction are mainly triggered by the reputation and regulations (e.g., Rennings, 2000; Jaffe, Newell and Stavins, 2005; Hernández-Perlines and Ibarra Cisneros, 2018).

In this study, we contend that, as reputation triggers quality management practices, this in turn is likely to influence environmental innovation. First, when CEOs with stronger reputation embark on quality management, their major concern is related to the protection of the environment through quality practices (Li, 2014; Moura, Sá and Abrunhosa, 2007). Second, reputation is a major strategic goal for CEOs or entrepreneurs (Downing and Ma, 2017). As such, they tend to focus on enhancing their reputation by introducing quality products and services that have a limited impact on the environment (Feng et al., 2006; Hoang et al., 2006). Based on the forgoing reasoning, we contend that:

> ***H_2:*** *Quality management mediates the effect of CEOs reputation on environmental innovation*

2.*6 Quality management, resource commitment and environmental innovation*

Research on quality management practices and firm-level outcomes has produced inconclusive findings (Ambec and Lanoie, 2008; Frondel et al., 2010). A major question is: what factors may moderate this linkage? In this study, we introduce resource commitment as a contingent

factor of the relationship between quality management and environmental innovation. Resource commitment reflects the extent to which a firm allocates its tangible and intangible assets and capabilities to enhance the efficiency and/or effectiveness with which a market offering is produced (Richey, Genchev and Daugherty, 2005; Hunt, 2000). The dynamic capabilities perspective suggests that the degree of commitment, configuration and deployability of resources affect the firm's competitive outcomes (Teece, Pisano and Shuen, 1997).

The resource-based view suggests that, when a firm commits resources to several uses within the firm, it boosts its quality process (i.e., competitive advantage), which in turn leads to innovation (Hunt and Morgan, 1996). In addition, earlier research suggests that a firm that commits greater resources to environmental practices tends to enhance its performance (Richey, Genchev and Daugherty, 2005). Interestingly, research also suggests that inadequate financial and human resources are major barriers to successful environmental practices (Rogers and Tibben-Lembke, 1999). In this study, we argue that, when a firm commits resources such as knowledge and financial resources, such resources boost the effect of quality management practices on environmental innovation practices. A major contention is that differences related to a firm's strategic resources are mainly related to differences in firm outcomes such as performance (Richey, Genchev and Daugherty, 2005). Therefore, we contend that a firm's ability to allocate enough resources is crucial for that firm to turn its quality management practices into improved environmental innovation. Thus, we suggest the following hypothesis:

> **H3**: *The greater the resource commitment, the stronger the positive relationship between quality management and environmental innovation*

3. Research method

3.1 Sample and data collection

This study involves an investigation of the environmental innovation activities of small firms in the manufacturing industry in Ghana, a sub-Saharan African economy. We considered

Ghana as our study setting because the country has initiated market and industrial reforms that encourage firms to adopt environmental innovation activities such as reduction of material/energy consumption during production process (Amankwah-Amoah and Debrah, 2010; Amankwah-Amoah et al., 2019). The sampling frame was derived from the Ghana Revenue Authority (GRA). The GRA is a Ghanaian body charged to assess, collect and account for tax revenue in Ghana. The GRA database contained 36,750 registered manufacturing firms.

We randomly selected 900 manufacturing firms from 36,750. The firms met the following criteria: (1) manufacturers of physical products; (2) firms owned and controlled by an individual or team of entrepreneurs; (3) firms with five years' business operation experience; (4) firms with a maximum of 150 employees (Ghana Statistical Service, 2000); and (5) firms with contact information for the CEO. Subsequently, we approached all the 900 firms with a questionnaire, administered in person.

The sampled firms met the following criteria: (1) manufacturers of physical products; (2) firms owned and controlled by an individual or team of entrepreneurs; (3) firms with five years' business operation experience; (4) firms with a minimum of five and a maximum of 150 employees (Ghana Statistical Service, 2000); and (5) firms with contact information for the CEO. The data were collected in a cross-sectional manner for the years 2016-2018, yielding 238 observations from the CEOs. Those who did not respondent cited company policies barring them from releasing company information to the public. After discounting missing values, we obtained 217 complete observations, representing a 24.11% response rate. On average, firms were aged nine years and employed 17 full-time employees. The average age of the CEO was 47 years.

3.2 Measure of constructs

All the items were measured on a 7-point Likert scale with anchors ranging from 1=strongly disagree to 7=strongly agree. The measures were taken from previous studies. Details of items, validity and reliability are shown in Table 1. We used five items from prior research (e.g., Li,

2014; Zhu and Sarkis, 2004) to capture environment innovation. Six items from Pereira-Moliner et al. (2012) captured firms' quality management practices. We measured resource commitment with three items adopted from Li (2014). Stakeholder pressure was measured using items taken from Charan and Murty (2018). Specifically, primary stakeholder pressure was composed of four items whilst the secondary stakeholder pressure was measured with three items. Finally, reputation was captured with three items from Shane and Cable (2002). The scale captures venture team members' reputation as CEOs.

We used seven control variables to account for their influence on the research model. These are firm size, firm age, prior venture growth, R&D expenditure, market scope, education and CEO age. We measured firm size as the number of firm employees (Hmieleski and Baron 2009). We measured firm age as the number of operational years of the firm. Market scope was coded as 0=locally/regionally traded; 1=internationally traded. Prior venture growth was measured by averaging revenue and employment growth rates for three years prior to the data collection. These scores were standardised and then summed (Baum and Locke, 2004). To measure R&D intensity, we calculated R&D investments as a percentage of total sales between 2015 and 2017. This approach to measuring R&D intensity is well established in the innovation literature (e.g., Sciascia et al., 2015). We controlled for CEO age in years and gender (male=0; female=1). Educational attainment was captured by asking respondents to indicate their level of education from the following: 1= 'high school', 2= 'bachelor's degree', 3= 'master's degree', 4= 'doctoral degree'.

Table 1: Constructs, measurement items and reliability and validity tests

Item description	Loadings (t-values)
Quality management: $\alpha = 0.79$; CR = 0.81; AVE = 0.55	
The management is not committed to quality (r)	0.79 (1.00)
The firm knows the customers' present and future needs.	0.77 (12.16)
The firm collaborates with intermediaries in order to improve the product offered in the establishment	0.90 (15.22)
The establishment staff receive training in quality-related issues	0.82 (13.11)
Improvements are identified in the service delivery process	0.78 (12.30)
A culture focused on the continuous improvement of the product offered is at work.	0.69 (8.20)
Reputation: $\alpha = 0.96$; CR = 0.96; AVE = 0.77	
Someone on the venture team has a reputation for successfully building public companies	0.75 (1.00)
A third party I respected vouched for the team's ability to start a successful company	0.92(14.10)

At least one venture team member is viewed by other investors as giving the venture credibility	0.85 (12.12)
Primary stakeholder pressure: α = 0.80; CR = 0.83; AVE = 0.59	
Government	0.92 (1.00)
Customers/suppliers	0.94 (23.24)
Employees	0.93 (22.62)
Competitors	0.92 (20.22)
Secondary stakeholder pressure: α = 0.88; CR = 0.90; AVE = 0.74	
Local community	0.87(1.00)
Non-governmental organisations	0.81 (14.74)
Media	0.78 (13.72)
Resource commitment: α = 0.86; CR = 0.89; AVE = 0.66	
We have insufficient financial resource to invest on environmental innovation practices (r)	0.91 (1.00)
We have sufficient management resource to invest on environmental innovation practices	0.95 (26.22)
We have insufficient investment in software establishment (e.g. introduction of technology, human resource training) for environmental innovation practices (r)	0.83 (18.65)
We have sufficient investment in hardware establishment (e.g. equipment and green material purchasing) for environmental innovation practices	0.86 (13.48)
Environmental innovation : α = 0.95; CR = 0.96; AVE = 0.71	
We engage in cross-functional cooperation for environmental improvements	0.83 (1.00)
We do not design of products for reduced consumption of material/energy (r)	0.88 (16.97)
We design of products for reuse, recycle, recovery of material, component parts	0.75 (12.71)
We avoid discharging hazardous/harmful/toxic substances	0.84 (15.19)

Note: α = Cronbach alpha value; CR=Composite reliability; AVE=Average variance extracted; r=reverse coded

3.3 Potential bias, validity and reliability assessment

To test a potential non-response bias, we divided the responses of the key constructs (reputation, quality management, resource commitment, primary stakeholder pressures, secondary stakeholder pressures and environmental innovation) into two groups: early and late respondents. Using independent t-tests for continuous variables (Greenwood and Nikulin 1996), we compared the means of the two groups following Armstrong and Overton (1977). Since no significant statistical differences were found between the two groups, we concluded that non-response bias is not a major concern in our sample.

Previous research shows that self-reporting data from CEOs/top managers are reliable and valid (e.g., Chandler and Hanks, 1993; Engelen, et al., 2014). Since our study relied on a single key informant, we followed Morgan et al. (2004) and tested for informant competency. Each CEO reported on a 7-point Likert scale ranging from 1=strongly disagree to 7=strongly agree to examine knowledgeability of the respondents on the subject matter, accuracy about the information they have given and confidence in providing answers to the questions (Morgan et al., 2004). Results of the informant competency analysis show a mean of score of 5.33 (SD = 0.44) for issues on whether they are knowledgeable about the survey or not, 5.45 (SD = 0.54)

for how accurate they are in responding to the questions, and 4.89 (SD = 0.39) for their confidence level in responding to the questions. These results mitigate concerns related to informant bias in this study.

We accounted for a potential common method bias using two statistical remedies. First, we used the approach advanced by Cote and Buckley (1987) and estimated three competing models. First, a trait-only model was estimated where each indicator loaded on its main latent factor. Second, we estimated a method-only model in which all the indicators loaded on one latent factor. Third, Model 3 involved estimation of method and trait model where a common factor linked all the indicators in Model 2. Table 3 presents the results of our common method bias analysis. Comparing the three models shows that Model 2 and Model 3 fit our data better than Model 1 and that Model 3 does not substantially fit the data better than Model 2. The results show that concerns related to common method bias do not describe our data.

Table 2: Common Method Bias Nested Models (Goodness-of-fit Statistics)

Model	χ^2	df	χ^2/df	RMSEA	CFI	NNFI	GFI
M1: Trait	1835.39***	1109	1.65	0.19	0.40	0.32	0.55
M2: Method	1769.40***	489	3.62	0.04	0.90	0.94	0.94
M3: Trait-method	1627.29***	465	3.49	0.02	0.97	0.97	0.99

*** $p < 0.001$. df, degrees of freedom; RMSEA=root mean square error of approximation; CFI=comparative fit index; NNFI=non-normed fit index; GFI=Goodness of fit index

Second, we utilised the approach suggested by Lindell and Whitney (2001) and included a marker variable. We used "I enjoy coming up with new ideas for products" as a marker variable, which is considered a measure of intrinsic interest in entrepreneurship, a variable theoretically unrelated to any of the constructs examined in this study. The results show that intrinsic interest in entrepreneurship had a non-significant correlation with the study's constructs ranging from -0.1 to 0.03. Inspecting partial correlations that were hypothesised to be significant, we found they were significant even after we had discarded the effect of common method bias. We used a 95% sensitivity analysis to verify this conclusion. Overall, the results show that issues relating to common method bias are substantially eliminated from this study.

Table 3: Fit indices for estimated measure models

CFA models	χ^2	df	χ^2/df	p-Value	RMSEA	CFI	NNFI	SRMR
Measurement 1	231.25	164	1.41	0.13	0.5	0.95	0.96	0.05
Measurement 2	103.12	88	1.71	0.09	0.4	0.98	0.97	0.06
Measurement 3	97.98	45	2.17	1.18	0.02	0.94	0.95	0.04
Measurement 4	24.11	20	1.20	0.31	0.03	0.97	0.93	0.06
Full measurement Model	1883.15	389	4.84	0.06	0.02	0.98	0.97	0.06

Measurement Model 1: Quality management and environmental innovation
Measurement Model 2: Primary stakeholder pressure and secondary stakeholder pressure
Measurement Model 3: Reputation
Measurement Model 4: Resource commitment
Full measurement (Model 5): all the retained items from Model 1 to 4 were estimated concurrently

Subsequently, we tested the reliability and validity of the study's measures using LISREL 9.10. The maximum likelihood estimation method was used in examining all the scales in confirmatory factors (CFA). We followed the procedure suggested by Cadogan et al. (2006), examined our scales in subsets, and estimated a full measurement model comprising all the scales (Baker and Sinkula, 1999). Table 3 reports four subsets and the full measurement model. The first model estimated quality management and environmental innovation whilst the second model included primary stakeholder pressure and secondary stakeholder pressure. Third, we included reputation. Model 4 estimated resource commitment. Finally, Model 5 included all the items retained in Model 1 through to Model 4, and these items were modelled simultaneously. Table 1 presents a list of items and their standardised factors, and t-values. The results of the factor loadings show positive and significant factor loadings. This confirms the convergent validity of our scales. The results also indicate that Cronbach alpha, composite reliability and discriminant validity of the variables exceeded the suggested threshold values of 0.70, 0.60 and 0.50 respectively (Bagozzi and Yi, 2012). We also obtained average variance extracted (AVE) values that were larger than the highest shared variances (HSV) between the constructs. This confirms the discriminant validity of our measures (Fornell and Larcker, 1981).

We assessed exact model fit using the traditional chi-square (χ2) test. In addition, we followed previous studies (e.g., Bagozzi and Yi, 2012) and inspected several approximate fit indices. Table 3 reports chi-square test and fit heuristics of the overall CFA model (Model 5).

Though the chi-square value was significant (χ^2/df = 1883.15/3.89 = 4.84), we obtained fit heuristics that were within the acceptable threshold: RMSEA= 0.06; SRMR = 0.07; NNFI = 0.98; CFI = 0.97.

Table 4: Descriptive statistics and correlations

	Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12
1.	Firm size	16.78	13.06												
2.	Firm age	9.12	5.21	0.03											
3.	Prior venture growth	10.37	10.07	0.02	-0.04										
4.	Market scope	0.41	0.50	0.09	-0.03	0.14**									
5.	R&D expenditure	0.09	2.42	0.14*	-0.02	0.12	0.13*								
6.	CEO age	47.28	11.63	0.00	0.01	0.01	0.12	0.03							
7.	Education	2.89	1.06	0.02	-0.00	0.17*	0.02	0.12	0.02						
8.	Reputation	4.32	1.35	0.07	0.11	0.02	0.15*	0.02	0.12	0.19**					
9.	Primary stakeholder pressure	4.65	1.33	0.02	0.06	0.07	0.09	0.13*	0.02	0.11	0.16*				
10.	Secondary stakeholder pressure	4.45	1.31	0.05	0.09	0.02	0.06	0.18**	0.04	0.06	0.14*	0.06			
11.	Resource commitment	5.16	0.57	0.19**	0.01	0.18**	0.10	0.21**	0.09	0.13*	0.07	0.19**	0.15*		
12.	Quality management	4.69	1.19	0.08	0.11	0.04	0.17*	0.19**	0.04	0.21**	0.13*	0.14*	0.12	0.16*	
13.	Environmental innovation	4.62	1.10	0.12	0.03	0.03	0.14*	0.16*	0.02	0.18**	0.29**	0.08	0.09	0.18**	0.20**

N = 217; *p<0.05; **p<0.01 (2-tailed test); S.D. = Standard Deviation

4. Results

In this study, Mplus statistical software was utilised to perform path analysis (Muthén and Muthén, 1998-2010). Specifically, the mediation hypothesis was tested using statistical significance of the indirect effect and confidence interval (MacKinnon, 2008). To attenuate the potential multicollinearity in testing moderating hypotheses, all the variables involved in the interaction were mean centred (Aiken and West, 1991). We found no threat of multicollinearity given that the highest variance inflation factor (VIF) was 2.06, which is well below the recommended threshold value of 10 (Neter, Wasserman and Kutner, 1990).

Table 1 presents the descriptive statistics and the correlations. The results of the study are presented in Table 5. Hypothesis 1a proposed that reputation positively relates to quality management. Results provide support Hypothesis 1a ($\gamma = 0.14$, $p < 0.05$). Hypothesis 1b stated that primary stakeholder pressures positively moderate the relationship between reputation and quality management. The results offer support for Hypothesis 1b ($\gamma = 0.38$, $p < 0.01$). In Hypothesis 1c, this study argued that secondary stakeholder pressures amplify the positive relationship between reputation and quality management. The results support Hypothesis 1c ($\gamma = 0.\ 0.41$, $p < 0.01$). Hypothesis 2 also received support: the indirect effect of reputation on environmental innovation via quality management was statistically significant (Estimate = 0.15, $p < 0.01$; 95% CI [0.09, −0.24]). Hypothesis 3 posited that the greater a firm's resource commitment, the stronger the positive relationship between quality management and environmental innovation. Hypothesis 3 also received support ($\gamma = 0.53$, $p < 0.01$).

To facilitate interpretation of the moderation hypotheses, a slope test was conducted by following Aiken and West (1991). As shown in Figure 1, reputation is more positively related to quality management when primary stakeholder pressures are greater. The results indicate that the relationship between reputation and environmental management is more positive when primary stakeholder pressures are high ($b = 0.19$, $t = 2.49$, $p < 0.01$). This result further supports

hypothesis H1b. Similarly, Figure 2 shows that greater levels of reputation positively relate to quality management. Finally, Figure 3 indicates that greater levels of resource commitment amplify the positive relationship between quality management and environmental innovation.

Table 5. Multilevel path analysis results (N = 217)

	Hypotheses	Quality Management	Quality Management	Environmental Innovation	
Controls					
Firm size		0.11*	0.12*	0.14**	
Firm age		0.04	0.04	0.05	
Prior venture growth		0.05	0.06	0.03	
Market scope		0.19***	0.21***	0.14**	
R&D expenditure		0.22***	0.24***	0.19***	
CEO age		0.04	0.05	0.02	
Education		0.23***	0.25***	0.18***	
Main effects					
CEO's reputation	H1b	0.14**	0.14**	0.33***	
Quality management (QM)				0.27***	
Primary stakeholder pressures (PSP)		0.15***	0.16***	0.12*	
Secondary stakeholder pressures (SSP)		0.13**	0.13**	0.10*	
Resource Commitment (RC)		0.17***	0.17***	0.21***	
Reputation x PSP	H1b		0.38***		
Reputation x SSP	H1c		0.41***		
QM x RC	H3			0.53***	
R^2		0.11	0.17	0.28	
				95% Confidence interval	
			Estimate	CI Lower end	CI upper end
Indirect effect					
ER→ EI (via QM)	H2		0.15***	0.09	0.24

* $p < 0.10$.; ** $p < 0.05$; *** $p < 0.01$. Standardised coefficients are reported. The model was estimated simultaneously. CI=confidence interval.

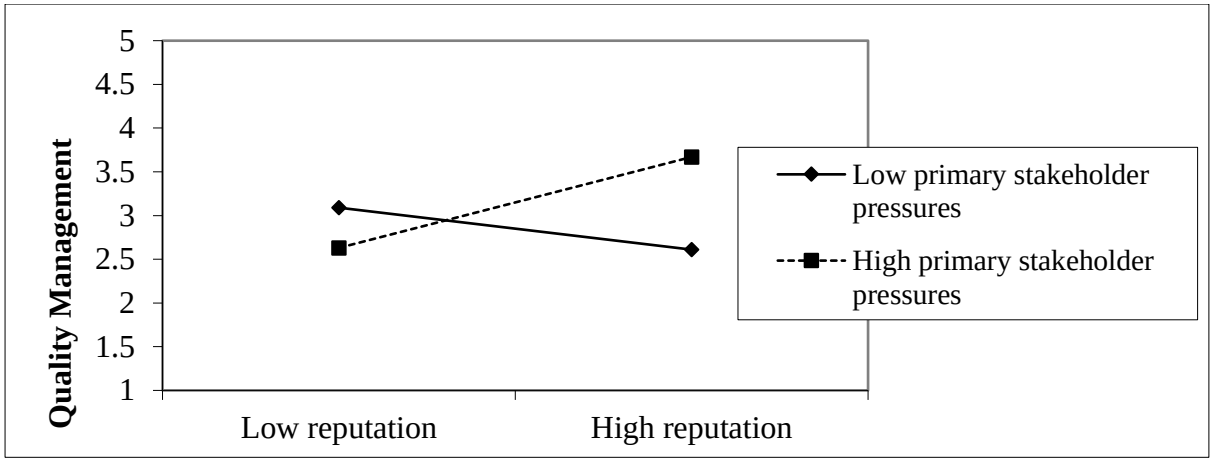

Figure 1: Interaction effect of reputation with primary stakeholder pressures on quality management

4.1 Robustness tests

We performed additional analyses to establish the robustness of our research model. First, we established whether our model complies with the requirements of Baron and Kenny's (1986) mediation approach. Accordingly, we undertook multiple ordinary least squares (OLS) regression using product innovativeness (Story, Boso, and Cadogan, 2015) as the dependent variable instead of environmental innovation measure.

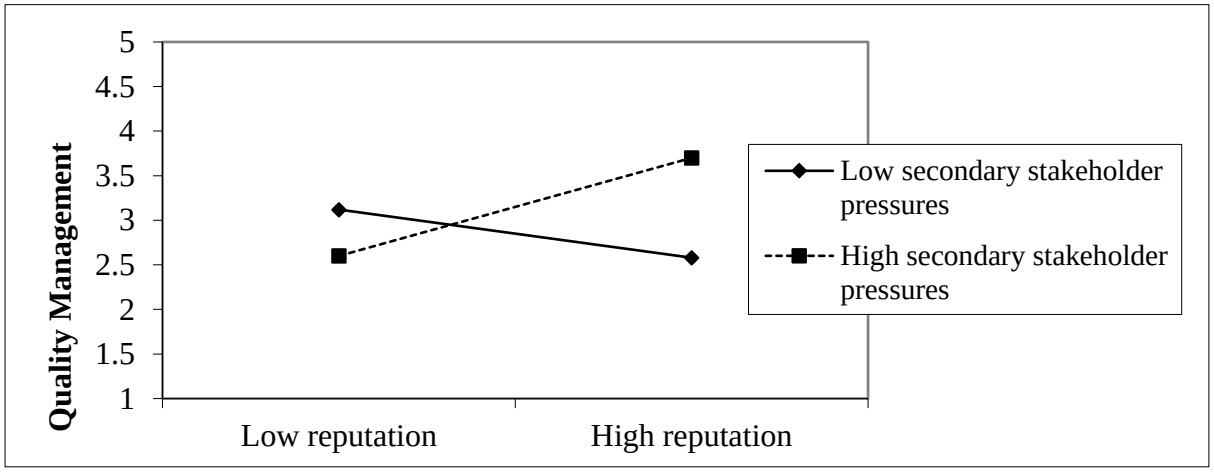

Figure 2: Interaction effect of reputation with secondary stakeholder pressures on quality management

Our findings are largely the same: the effects of reputation on quality management ($\beta = 0.13$, $p < 0.05$), reputation on innovation ($\beta = 0.29$, $p < 0.01$) and quality management on innovation ($\beta = 0.26$, $p < 0.01$) were all supported. We also found that the effect of' reputation

on innovation is not statistically significant (β = 0.04, *ns*) when the mediator (quality management) is introduced in the regression equation. These results are consistent with Baron and Kenny's (1986) conditions for mediation. In addition, the magnitude and direction of all the moderators were as hypothesised.

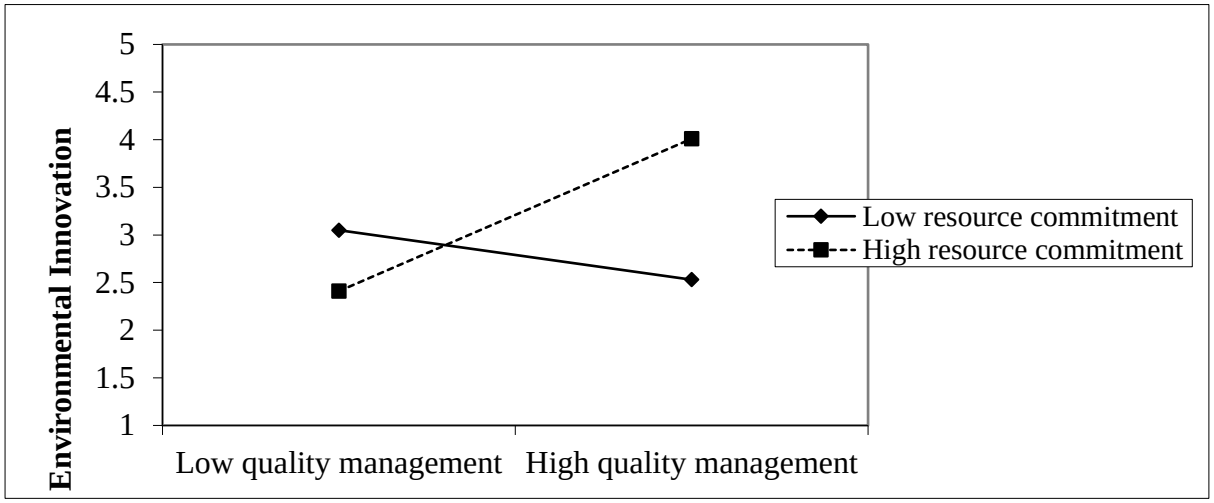

Figure 3: Interaction effect of quality management with resource commitment on environmental innovation

Second, we went beyond the traditional mean-centring approach to treating multicollinearity in our data by drawing on 90% of the sub-sample to re-estimate an OLS regression model (Echambadi and Hess, 2007). Since we did not find any instability of the regression coefficients, we concluded that multicollinearity does not affect our findings. Third, we followed the approach suggested by Landis and Dunlap (2000) to assess the direction of causality between quality management and environmental innovation. Accordingly, we set quality management as the dependent variable and environmental innovation as the independent variable and tested the interactive effect of the environmental innovation and the moderating variable (resource commitment) on quality management. We found that none of the reverse interaction terms are significant. Hence, we concluded that reverse causality has no influence on our data (Cao, Gedajlovic and Zhang, 2009).

5. Discussion and Conclusion

Despite increasing research attention on reputation and how it influences firm-level outcomes, our understanding relating to how reputation influences quality management and consequently environmental innovation has not been examined in the literature. In this study, we used the resource-based view and stakeholder theory to examine the mediating mechanism of the relationship between reputation and environmental innovation. In addition, we answered the question relating to when reputation is pronounced in driving quality management by introducing stakeholder pressures (i.e., primary and secondary stakeholder pressures) as potential moderating factors. Further, we explored when quality management practices are more potent in driving environmental innovation by introducing resource commitment as a contingent factor. Using data from a manufacturing industry sample of 217 small firms from Ghana, we observed that quality management mediates the relationship between reputation and environmental innovation. Results from the study also suggest that variability in reputation helps explain changes in quality management. Findings further indicate that increases in reputation and greater degrees of primary and secondary stakeholder pressures are related to increases in quality management. In short, the study finds that, when CEOs with greater reputation face intense pressures from primary and secondary stakeholders, firms are likely to report higher quality management practices. Finally, the study finds that a firm's level of resource commitment amplifies the positive relationship between quality management and environmental innovation. Thus, when a firm commits resources to quality management practices, the potency of its quality management programme as a driver of environmental innovation is amplified. These results help us make three important contributions to the innovation literature.

First, unlike previous research that indicates that reputation is crucial for start-ups seeking venture capital (Amankwah-Amoah and Syllias, 2020; Petkova, Rindova, and Gupta

2008; Petkova, 2014) and venture performance (Downing and Ma, 2017), we examine the indirect effect of reputation on environmental innovation. A major contention is that an examination of the role of the individual's reputation in driving environmental innovation is lacking. Endorsing an emerging scholarly effort studying the role of reputation in driving firm-level outcomes (e.g., Downing and Ma 2017; Shane and Cable, 2002) and the resource-based view (Barney, 1991), we address this gap by indirectly linking reputation to environmental innovation. Our results suggest that, for CEOs in a developing country, such as Ghana, reputation is critical for enhancing quality management and environmental innovation. Reputation represents an individual capability that can be used to gain access to resources such as financing. For CEOs operating in resource- and institutional-constrained environments, a major requirement to command trust for the firm's products and services is to go beyond the formal codes and contracts in order to protect themselves against malfeasance (Peng, 2000). Thus, the implication is that high levels of reputation can enhance quality management and environmental innovation in developing economy settings.

Second, this study contributes to the literature by investigating how primary and secondary stakeholder pressures condition the reputation-quality management linkage. Although reputation can drive quality management practices in organisations, a strong reputation might be insufficient for quality management practices. Arguably, previous research has focused on destination networks (Strobl and Peters, 2013), venture financing (Petkova 2014; Shane and Cable, 2002) and performance (Downing and Ma, 2017). However, scholarly efforts showing how reputation enhances quality management and the extent to which its effectiveness is moderated by primary and secondary stakeholder pressures have been notably slow to emerge. Although stakeholder theory (Donaldson and Preston, 1995; Freeman, 1984) is recognised as an important theoretical milieu from which to examine firm-level outcomes, the reputation literature has to fully explore the role of primary and secondary stakeholder

pressures in determining a firm's level of quality management practices. This study addresses this knowledge deficit by demonstrating that quality management is enhanced when CEOs with greater reputation are faced with greater pressures from primary and secondary stakeholders. This finding is critical for CEOs and managers in less developed economies where degrees of market uncertainty are greater due to weak institutional environmental factors.

Third, studies examining quality management practices and firm-level outcomes such as innovation have been inconclusive (e.g., Ambec and Lanoie, 2008; Frondel et al., 2010). The mixed results are in line with the view that the benefits of greater quality management practices may depend on some conditional factors. Accordingly, we draw on the RBV of the firm to introduce resource commitment as a factor that may impact on the quality management-environmental innovation relationship. In doing so, we have developed a better understanding of the conditions under which the benefits of quality management are more or less evident to show how best to leverage quality management for environmental innovation.

Beyond the theoretical contributions, this study offers some practical implications. First, the findings that reputation improves quality management and that this relationship is significantly enhanced under conditions of intense pressure from stakeholders are important for managers in a developing country setting such as Ghana. The significance of these findings is that Ghanaian CEOs can be guided to build a greater reputation for quality management. In addition, this can guide to improve quality by paying attention to stakeholders in society. Moreover, the results are critical for helping developing-country ventures interact with firms from developed countries. More importantly, products from developing countries can receive good endorsements through quality management practices.

Second, the finding that quality management significantly influences environment innovation when resource commitment is greater is relevant for firms undertaking innovations. Particularly, firms will be well-served by committing additional financial resources to quality

management practices to yield greater innovation. Given that environmental innovation remains one of the monumental challenges for firms in developing countries (Rahman, Uddin and Lodorfos, 2017; Li, 2014; Zhu and Sarkis, 2004), greater commitment of resources to quality management practices is likely to convert quality management into improved environmental innovation. This insight is particularly important for managers, who should pay a great deal of attention to resource commitment in their innovation efforts.

6. Limitations and future research trajectory

As with most empirical studies, our study has some limitations that open fresh avenues for future research. First, we relied on a single informant in each firm to collect subjective data. A major concern is that CEOs may be biased in their responses. Yet, this concern must be considered against the benefits of studying entrepreneurial firms as the CEO's perception of the firm's success or failure has been considered a major motivation influence (Dess and Robinson, 1984). We implore future studies to consider using objective financial data to measure environmental innovation performance. Second, our study was conducted in Ghana, a sub-Saharan African country, so the results must be evaluated in the context of a developing country. Though Ghana shares some common characteristics with other developing markets, the unique and varied contextual idiosyncrasies of other developing economies may provide additional insight for theory development. For example, future studies may wish to examine how cultural differences in emerging countries provide additional insight into quality management and environmental innovation. Consequently, future research efforts should be directed to exploring the role of cultural factors that influence how CEOs build reputation and how this influences quality management and environmental innovation. In addition, future studies should be directed to examining the role of reputation in building networks such as social, business and political networks in developing countries. Finally, our study relied on the manufacturing industry for data. This limits the findings of the study. Future studies should

consider using multi-industry and cross-country data to examine the applicability and generalisability of the findings to other contexts.

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